

# Power Focus Quick Guide



## SAFETY INSTRUCTIONS

When using electric products, basic precautions should be followed:

- THIS EQUIPMENT MUST BE EARTH GROUNDED
- Always disconnect the equipment from the mains, by pulling the plug, before opening it for installation, service etc
- Do not use this product near water

*Atlas Copco*

## CONTENTS

### GETTING STARTED

3

- Putting together the Tensor system
- Mounting and connecting
- The Compact user interface
- The Graph user interface
- ToolsTalk PF

### STRATEGIES

10

- Setting up the normal two-stage tightening
- Monitoring the first stage of your tightening
- Yield control
- Detecting a “rehit”

### CONFIGURATION

14

- Setting up an accessory in W07
- Logic Configurator
- Station control using Logic Configurator

### TROUBLE SHOOTING

25

- Event codes

## Putting together the Tensor system

Power Focus 4000 is the electric tool controller replacing the 3100 generation, as the control and monitoring system for Atlas Copco's Tensor and ETX electrical tools. This advanced fastening system consists of:

– a **Power Focus controller**. Two different hardware versions are available, where only the user interface differs between them

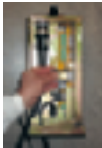


**PF 4000 Compact**



**PF 4000 Graph**

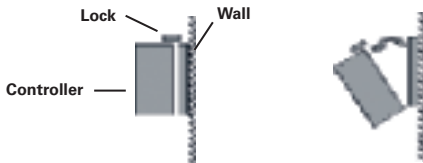
– an **RBU**: This is the combined software backup memory and software key. This "Remote Backup Unit" is available in Gold, Silver, Bronze, X and DS versions as standard



– and of course a **cable** and a **tool**. These are available in numerous torque ranges and variants

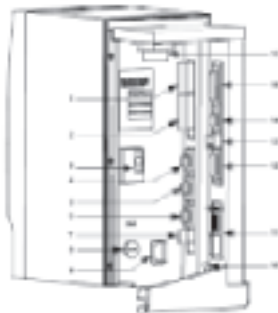


## Mounting and connecting



- 1) Open the locking mechanism
- 2) Open the controller slowly towards you
- 3) Connect the tool cable, power cable etc. (see picture below)
- 4) Connect the RBU
- 5) Check that the GFI (Ground Fault Interruptor) is switched on
- 6) Close the controller and lock it
- 7) Connect the power cable to a power supply (115/230 V)
- 8) Turn the power on

**IMPORTANT!** Whenever replacing a tool, always turn the power off.



1. Digital input – Internal 24 V DC
2. Relays
3. Ground Fault Interrupter (GFI)
4. Serial #1 (RS232)
5. I/O Bus #1
6. I/O Bus #2
7. Remote start
8. Main fuse
9. Main power connector
10. Ground connection
11. Field bus card (optional)
12. RBU
13. Ethernet
14. Serial #2 (RS232)
15. Printer
16. Tool output

## The Compact user interface



1. OK
2. NOK
3. Alarm
4. AutoSet
5. n x OK
6. Job OK
7. STAT
8. Prog Control

1. **OK** The tightening result is within specified limits
2. **NOK** The tightening result is outside of specified limits
3. **ALARM** Steady light means the alarm needs to be acknowledged. Flashing light means no acknowledgment is needed
4. **AUTO SET** The AutoSet programming routine is running
5. **n x OK** The no. of OK tightenings equals batch size
6. **JOB OK** A Job has been completed
7. **STAT** Any of the calculated values falls outside of the statistical limits
8. **PROG CONTROL** Steady light indicates an unlocked keypad. Flashing green means that programming control is taken by ToolsTalk PF

## The Compact user interface

Button	Functionality
Question mark	Pressing it will show RBU type (Au = Gold, Ag = Silver etc), installed software release, connected tool type, active Pset and Job
F	<p>Press <b>F</b> (Function key) to display functions. To display function F1 press <b>F</b> once, to display function F2 press <b>F</b> twice etc. Press <b>Enter</b> to access and edit a function. When finished, press <b>F</b> repeatedly to display result mode again (or else it will take 30 seconds for the screen to update automatically)</p> <p>Note: The functionality is dependent on the RBU version.</p>
F1 / Ft	Final target
F2 / tunE	Torque tune factor (DS mode only)
F3 / tool	Motor tuning. Press and hold the tool trigger until "done" is shown
F4 / Pset	Change the Pset (in cases where this has been enabled)
F5 / batS	Set the batch size (0 to 99)
F6 / DISC	Disconnect tool. Await "Safe to disconnect" before disconnecting
F7 / stun	Sync motor tuning. The LH no. shows the percentage of sync members already tuned. The RH no. shows the progress of the ongoing tuning
F8 / Stun	Controller IP address. Restart the PF after changing the address
AutoSet	Start AutoSet, set the target torque and make tightenings on the actual joint to let the controller program the tightening parameters

## The Graph user interface

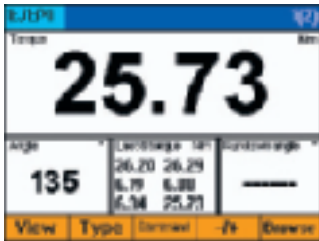
The color display offers easy monitoring and programming. It can be configured to show information from any Power Focus within a cell. The display is fully configurable - the picture below shows only one example.

Channel number in the cell

Job no.

Pset (P) or Multi-stage (M) number

Batch count no. and (batch size)



Press View if you want to see

- tightening traces
- statistics
- events

Press Browse if you want to change the view of the lower right window, to see for example the no. of tightenings left in a batch

### Connect via USB

1) Turn on your PC and the PF, then 2) connect the USB cable. Your PC should detect the PF, which makes it possible to start TTPF and connect to the PF using the "serial" option. Otherwise you need to install a USB driver, which is available on the installation CD of TTPF.



### Connect via Ethernet

Use a crossed Ethernet cable to connect directly to the PF, alternatively use normal cables and an Ethernet switch. Then follow these steps to set up the network.

- Connect the cables between the switch and the PF and between the switch and the PC
- Set the IP address, e.g. [192.168.0.?] where ? can be between 0 and 255, and the subnet mask e.g. [255.255.255.0] of the PF unit(s) over its keyboard. In the Graph, you do the setting under Controller -> Communication, and in the Compact, the IP address is set under F8. Each unit needs its own unique address, but the subnet mask must be the same. Restart the Power Focus

Then, set the IP address and subnet mask of your PC. Using Windows XP<sup>®</sup>, this is done via My Computer -> Network connections, where you right-click on Local Area Connection and choose Properties. In the window that appears, select Internet Protocol as indicated below, and click the button Properties. In the window that appears, you set an IP address (unique) and the same subnet mask as for the PF.

**Remember to re-set your PC to the normal settings after the session.**

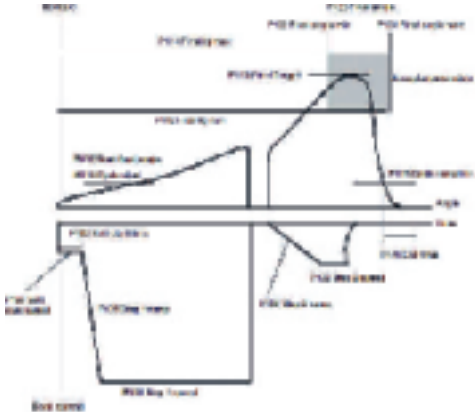


## Connect via Ethernet continued



# Setting up the normal two-stage tightening

## Torque Control / Angle Monitoring – Two Stage



### To quickly get started, either

- 1) make the basic settings using AutoSet
  - a) On the Compact, this is done by i) pressing the "arrow" button, ii) confirming by pressing Enter, iii) entering the final torque target with the '+' and '-' buttons, and iv) confirming with the Enter button
  - b) On the Graph, the final torque target for AutoSet is entered under the menu item Pset -> AutoSet

In both cases, you then just make tightenings on the desired joint until the AutoSet lamp goes out

- 2) or you use QuickProg in ToolsTalk PF or on the Graph (selecting Pset -> Quick prog) if you already have an idea of the joint hardness

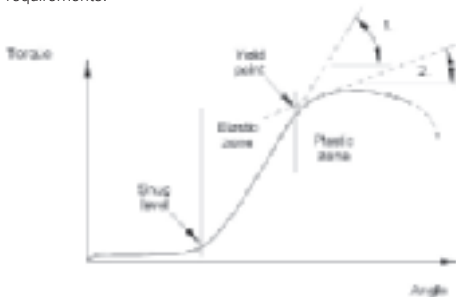
## Monitoring the first stage of your tightening

The Power Focus offers several ways to control and monitor the rundown of the screw cycle. The rundown is the rotation before snug level (where the screw head starts compressing the joint).

- Rundown Monitoring:** monitor the angle between cutting the first thread and a settable torque level
- PVT Selftap:** monitor torque during an angle window in the beginning of the rundown
- PVT Monitoring:** monitor torque during an angle window somewhere within the rundown phase
- PVT Compensate:** compensate for torque lost to e.g. thread forming during rundown, measured in real-time for each individual screw
- Post-view torque:** a more flexible strategy, allowing a max torque for a settable window and a min torque for another window to be defined during rundown

## Yield control

**Using Yield control** as tightening strategy gives higher clamp force out of the same screw, than with Torque control. A problem joint could benefit from a change of strategy, or it can be redesigned into smaller dimensions and lower weight, while meeting the same clamping requirements.



**Power Focus** samples a filtered torque several times during the clamp force build-up in the elastic zone of the screw. The increase (the difference) between the last and the third last mean torque is calculated. If this increase is bigger than the previously biggest increase, it is stored as the new shutoff reference ( $T_{max}$ ).

When the gradient decreases (approaching yield), the torque increase will also get smaller, and finally go under the set percentage of  $T_{max}$  which is the criteria for tool shut-off.

## Detecting a "rehit"

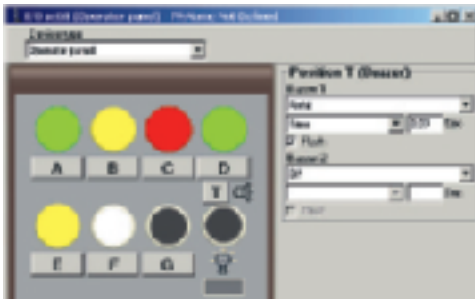
**At hand-held** applications, there is always a risk that the operator starts a tightening on an already tightened bolt. This can disturb the station's batch counting.

**Power Focus** has a rehit detection based on tool speed in the first stage, and tightening angle in the final stage.

To **NOT** be judged as a rehit, the tightening must reach 25% of Step 1 Speed (P131) in the first stage, OR have an angle between First (P111) and Final Target (P113) of at least 121 degrees.

A rehit will render a NOK tightening result, although the torque and angle might have fallen inside the set monitoring windows. The rehit event can be put out on a relay or the fieldbus for external process control devices.

## Setting up an accessory in W07

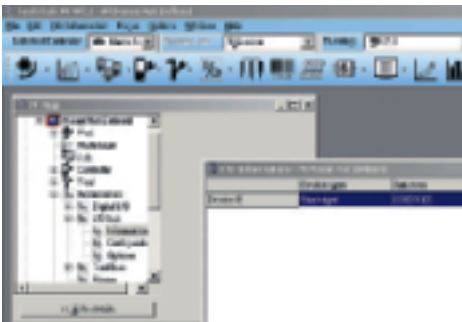


The setup of an accessory is very easy, using ToolsTalk PF W07. If you click your way past Accessories in the PF Map, then I/O bus, then right-click on Configuration, you will be led through the necessary steps by the program.

## Setting up an accessory in W07

### How do I trouble-shoot the Accessory?

To find out whether Power Focus has established communication with the Accessory, go to the I/O bus Information window. There, you can e.g. see to which Device address the unit is set. There is no longer a need to open the Accessory to check the rotary switch.



## Logic Configurator

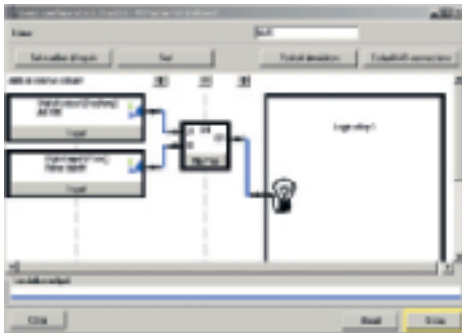
### Assumption:

You want to use the green lamp on the Stacklight to signal a Job OK. The lamp should light up at Job OK and should come off only when you push the Stacklight button.

### Solution:

Create a Logic Configurator that controls the described "process". It should have two Inputs – one for the Job OK signal and one for the "button push".

Use a Flip-flop gate (SR type) to control the on or off of the lamp. Let the Job OK signal be the "S1" input. But how do we treat the "button push" signal?





## Logic Configurator

Go to Accessory setup and program the Stacklight. The illustration shows that the output signal of our Logic Configurator sheet is called Logic Relay 1. We give the "button push" signal the name Logic digin 1, see below.



Back to the Logic Configurator sheet, where we now program the second input signal, for the "R" input of the gate. The signal Logic digin 1 can be found in the "Digital input" selection.

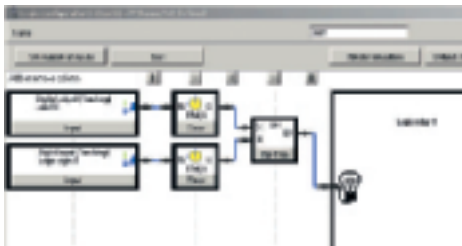
## Logic Configurator



Now store your program to the Power Focus and test it by working the Job. You might not be quite happy with the result. Why?

1. The Job OK signal is a "long" internal signal, staying active until the next Job is activated. The high Job OK signal on the S1 input prohibits the output from going low. The solution could be to convert the flank "low to high" of Job OK into a pulse. So let's add a Timer TP gate
2. The same problem could occur from the "button push". We could for example get a bouncing signal from a shaky team leader. So let's convert the first flank also of this signal into a well defined pulse, using a Timer TP gate. See the following illustration

## Logic Configurator



### Comment:

Compare the Job OK signal, marked "Tracking" in the Configurator sheet, with the OK signal, marked "Pulse". The OK signal is already a 0,1 s long pulse, and would not need the conversion with the help of a Timer gate.

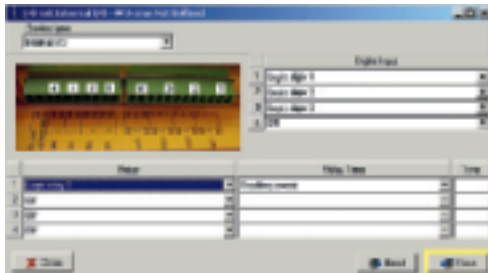




## Station control using Logic Configurator

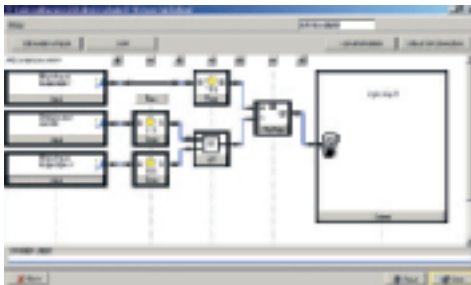
### Solution

Denote the external signals (2 position sensors, 1 key switch) on the digital inputs with logical names, as well as the relay signal we want to create (for the air cylinder).



## Station control using Logic Configurator

Create the Logic Configurator for the air cylinder on Relay 1. It will need one input to activate the cylinder and two inputs to deactivate it (one for the key switch and one for Job OK).



## Station control using Logic Configurator

Create a second LoCo. With this LoCo, we simply want to trigger the Job, using the "Work piece fixtured" signal.



Create a third LoCo, that uses the key switch signal as input (like LoCo 1 above) to abort the Job.



Store the Logic Configurators to the PF4000. The Stacklight lamp functions, as described in the flow chart above, are set up in the normal way, using TTPF.



## EVENT CODES

Event code	Group	Description
E001-E099	0	Rundown failures
E100-E199	1	Event-related errors
E200-E299	2	User input events
E300-E399	3	Statistical events
E400-E499	4	Communication events
E500-E599	5	Hardware events TOOL
E600-E699	6	Hardware events DC3000/MC3000
E700-E799	7	Hardware events
E800-E899	8	Software events
E900-E999	9	Events MMI3000

Event	Event Text	Acknow- ledge	Explanation
<b>E000-E099: Rundown errors</b>			
E003	Incorrect programming	-	Check that there is socket movement in the second stage
<b>E100-E199: Event-related errors</b>			
E102	Rundown prohibited due	-	This error code is displayed after a NOK tightening to Lock on Reject when the function Lock on Reject is activated. In this case the tool is disabled, the tool can be unlocked with a digital input or with the tool ring.
E103	Tool locked by digital input	-	The tool is locked via the digital input
E107	Rundown prohibited due to Line Control, batch not enabled	-	A job using Line Control is selected. The job does not start until Line Control Start signal is received.
E112	Rehit	-	

E113	Current limit reached – Rundown aborted.	Yes	The current limit has been reached; the drive is disabled
E117	Tool lokal – cannot access RBU		Power Focus cannot communicate with RBU and must be restarted to protect data. For more information see section Sub information for event codes.
E120	MC Motortuning failure	Yes	Motor tuning failed. The trigger could have been released before the end of the motor tuning or the tool has a defect.
E121	OpenEnd tuning failure	Yes	This error indicates that the open end tuning command has not been successfully performed. Either the command was aborted by the operator or the command could not be performed for any other reason.
E125	Alarm on timeout /alarm on torque lost		If "Alarm on timeout" is activated, this event code indicates that a timeout caused the tightening to be aborted
E126	Multistage aborted	-	This error indicates that the current running multistage has not been performed entirely (the drive has been shut off or the tool trigger was released before the end).
E127	PVT shut off	-	This error indicates that the drive was shut off in the Self-tap or prevail phase of the rundown.
E128	Trigger lost	-	When the function Trigger lost is activated in the Pset, this error indicates that the trigger of the tool was released before final target.
E129	<b>Torque lower than target</b>	-	When the function torque lower than target is activated in the Pset, this error indicates that the torque result is below final target. The torque status is NOK even if the torque result was larger than final torque min.
E130	Post view torque shut off		Post view torque conditions were not fulfilled.

E131	Tool Disconnected	Yes	This error indicates that the tool is not connected to the controller or that the tool cable has been damaged.
E132	Wrong tool start input setting	Yes	1) Check if the remote start wiring in the PF is correctly set in accordance to the settings in the Configuration parameters (C220). 2) Check if the tool trigger is constantly pressed or if there is some malfunction in the tool.
E133	Tool locked by ToolsTalk	-	The tool is locked by Tools Talk.
E134	MC Motortuning failure	-	The target signal is active in the drive though the tightening has been acknowledged by the CC-card.
E136	Rundown prohibited due to batch locked	-	This error is displayed if the function lock at batch OK is enabled and when the batch is completed. The tool can only be unlocked via a digital input.
E137	The tool is locked by the field bus.caused the tightening to be aborted	-	The tool is locked by the field bus.caused the tightening to be aborted
E138	Wrong tool start input source	-	It is only possible to start the tool from the selected tool start select source.
E139	Tool locked via Open protocol	-	The tool is locked via Open protocol.
E140	Insert user ID card to release tool	-	The tool is locked, the user must insert his ID card in the card reader to release the tool.
E141	<b>Tool locked during work order</b>		Multiple identifiers; tool is locked during work order. Unlock will follow upon receiving correct identifiers
E145	Tool locked by Timer enable tool		The tool is locked by digital "timer enable tool"
E147	Tool locked by click wrench Pset		A click wrench Pset is in use. For more information see section Sub information for event codes.
E149	<b>Tool locked, disable loosening at OK</b>	-	"Disable loosening at OK" has locked the tool for loosening
E150	<b>Job client does not respond</b>	-	When running a Cell Job, this error is displayed by the job master when one of the job members does not respond.
E151	Job in OFF mode	-	It is not possible to select a new job, the PF3000 is in Job Off mode.

E152	PF locked in job mode	-	This error appears when in a forced cell job an attempt is made to tighten with a controller which is not currently active or when a controller has performed all tightenings.
E153	Not Ok to select new job	-	A job is currently running, it is not possible to select a new job until the first is finished in some way (completed or aborted). This message is also displayed if a job is selected on a job member.
E154	Remote job running	-	When running a Cell Job, this is displayed by the job members when a cell job is selected on the job master.
E155	Remote job aborted	-	When running a Cell Job, This is displayed by the job members when a cell job is aborted.
E156	Job members lost	-	When running a Cell Job, this is displayed by the master when it has lost contact with one of its job members.
E157	Job reference lost	-	When running a Cell Job, this is displayed by the job members when they have lost contact with their Job Master.
E158	Invalid Job ID	-	When the selected job does not exist.
E159	No Pset In Selected Job	-	When the selected job does not contain any Pset.
E160	Job select source not valid	-	Attempt to select a Job with the wrong input source.
E161	Line Control Alert 1	-	The line control has been activated, and the first control alert limit has been reached.
E162	Line Control Alert 2	-	The line control has been activated, and the second control alert limit has been reached.
E166	Job aborted		A running job has been aborted
E167	Max coherent NOK tightenings reached		The pre-set no. of successive NOK tightenings was reached. Unlock via digital input.
E175	Configuration will be erased at next reboot		Due to changed memory setup. Valid for both PF and RBU.
E176	IPM memory needed		Not possible to configure without IPM memory

E177	Functionality not in RBU		The user is trying to employ functionality not enabled in this RBU
E178	Memory allocation error		The user is trying to allocate more memory than is available
E179	Totally configurable memory needed		Function not possible without "totally configurable memory"
E180	Euchner Ident System only supports Siemens 3964R protocol	-	The protocol settings for the serial COM port 1 is not set to 3964R, it is not possible to use the Euchner Ident System with this configuration.
E181	Not possible to read ID card	-	When running a Cell Job, this is displayed by the job members when a cell job is aborted.
E190	Wrong ST scan source		Attempt to scan from wrong source
E191	ST scanner over-heated		The ST scanner has exceeded its highest allowed value
<b>E200-E299: User input error</b>			
E206	Pset number invalid	-	An attempt was made to do a tightening with the wrong Pset within a job.
E207	Wrong Pset Select Source	-	Attempt to select Pset from a source not specified in the Cset.
E208	Not Ok to select new Pset	-	It is not allowed to select new Pset when the already selected Pset is auto selected by Job.
E211	Wrong identifier input source		Wrong input source for identifier string
E212	Pset or Multistage stored		This event is displayed whenever a Pset or Multistage is stored or restored
E220	Fastener broken		Displayed if fastener (screw or nut) break during yield control
E221	Too few samples for yield control		Too few samples for mean tq calculation in yield algorithm. Parameter No degrees too small or speed too high during yield control
E233	Final target range error	-	This error code is displayed when an attempt is made to tighten with a final target out of range (larger than tool max torque or 9999).
E234	Start final angle range error	-	This error code is displayed when an attempt is made to tighten with a start final angle out of range.

E240	Password Incorrect Input Source	-	The password is entered from an invalid source according to the configuration.
E250	Maxtime for first tightening run out (job)	-	This message is displayed and the job is terminated if the first tightening is not performed within the specified time.
E251	Maxtime to complete job run out	-	This message is displayed and the job is terminated if the job is not completed within the specified time.
<b>E300-E399: Statistical errors</b>			
E333	Not allowed subscription	-	The requested statistic subscription is not allowed. For example it is not allowed to set an angle statistic subscription for a Pset using only the torque control strategy.
E334	No statistic available for this Pset	-	The Pset strategy is not suitable to calculate statistics (no strategy is chosen, DS control)
E335	Not enough data	-	Not enough data were available to calculate the statistic control limits.
E336	Mem alloc fail	-	It was not possible to allocate enough memory for the statistic subscription.
E340	Xucl tq	-	The last subgroup mean torque value is larger than the upper control limit.
E341	Xlcl tq	-	The last subgroup mean torque value is lower than the lower control limit.
E342	Rucl tq	-	The last subgroup range torque value is larger than the upper control limit.
E343	Rlcl tq	-	The last subgroup range torque value is lower than the lower control limit.
E344	Cp tq	-	The torque Cp is lower than 2.
E345	Cpk tq	-	The torque Cpk is lower than 1.33.
E346	7inc x tq		Trend deviation alarm – the subgroup torque mean value has increased 7 times in a row
E347	7dec x tq		Trend deviation alarm – the subgroup torque mean value has decreased 7 times in a row
E348	7inc x r		Trend deviation alarm – the subgroup torque range has increased 7 times in a row

E348	7dec x r		Trend deviation alarm – the subgroup torque range has decreased 7 times in a row
E349	7dec r tq		Trend deviation alarm the subgroup torque range value has decreased 7 times consecutively
E350	7above x tq		Trend deviation alarm – the subgroup torque mean value has exceeded the average mean value of the latest ten subgroups 7 times in a row
E351	7below x tq		Trend deviation alarm – the subgroup torque mean value has been below the average mean value of the latest ten subgroups 7 times in a row
E352	7above x r		Trend deviation alarm – the subgroup range value has exceeded the average range of the latest ten subgroups 7 times in a row
E353	7below x r		Trend deviation alarm – the subgroup range value has been below the average range of the latest ten subgroups 7 times in a row
E354	2sigma x tq	-	Trend deviation alarm, the last subgroup torque average is outside $\bar{X}_{tq} - 2\sigma$ .
E355	2sigma r tq	-	Trend deviation alarm, the last subgroup torque range average is outside $R_{tq} - 2\sigma$ .
E360	Xucl ang	-	The last subgroup mean angle value is larger than the upper control limit.
E361	Xlcl ang	-	The last subgroup mean angle value is lower than the lower control limit.
E362	Rucl ang	-	The last subgroup range angle value is larger than the upper control limit.
E363	Rlcl ang	-	The last subgroup range angle value is lower than the lower control limit.
E364	Cp ang	-	The angle Cp is lower than 2.
E365	Cpk ang	-	The angle Cpk is lower than 1,33.
E366	7inc x ang	-	Trend deviation alarm, the subgroup angle mean value has increased 7 times consecutively.

E367	7dec x ang	-	Trend deviation alarm, the subgroup angle mean value has decreased 7 times consecutively.
E368	7inc r ang	-	Trend deviation alarm, the subgroup angle range value has increased 7 times consecutively.
E369	7dec r ang	-	Trend deviation alarm, the subgroup angle mean value has decreased 7 times consecutively.
E370	7abowe x ang	-	Trend deviation alarm, the subgroup angle mean value has been above the average mean value of the average of the last ten subgroups 7 times consecutively.
E371	7below x ang	-	Trend deviation alarm, the subgroup angle mean value has been below the average mean value of the average of the last ten subgroups 7 times consecutively.
E372	7abowe r ang	-	Trend deviation alarm, the subgroup angle range value has been above the average range value of the average of the last ten subgroups 7 times consecutively.
E373	7below r ang	-	Trend deviation alarm, the subgroup angle range value has been below the average range value of the average of the last ten subgroups 7 times consecutively.
E374	2sigma x ang	-	Trend deviation alarm, the last subgroup angle average is outside Xang-bar-bar - 2 sigma.
E375	2sigma r ang	-	Trend deviation alarm, the last subgroup angle range average is outside Rang-bar-bar - 2 sigma.
E380	Xucl cm		The last subgroup mean CM value is larger than the upper control limit.
E381	Xlcl cm		The last subgroup mean CM value is lower than the lower control limit.
E382	Rucl cm		The last subgroup range CM value is larger than the upper control limit.
E383	Rlcl cm		The last subgroup range CM value is lower than the lower control limit.
E384	Cp cm		The CM Cp is lower than 2.
E385	Cpk cm		The CM Cpk is lower than 1.33.



E386	7inc x cm		Trend deviation alarm, the subgroup CM mean value has increased 7 times consecutively.
E387	7dec x cm		Trend deviation alarm, the subgroup CM mean value has decreased 7 times consecutively.
E388	7inc r cm		Trend deviation alarm, the subgroup CM range value has increased 7 times consecutively.
E389	7dec r cm		Trend deviation alarm, the subgroup torque range value has decreased 7 times consecutively.
E390	7above x cm		Trend deviation alarm, the subgroup CM mean value has been above the average mean value of the average of the latest ten subgroups 7 times consecutively.
E391	7below x cm		Trend deviation alarm, the subgroup torque mean value has been below the average mean value of the average of the latest ten subgroups 7 times consecutively.
E392	7above r cm		Trend deviation alarm, the subgroup CM range value has been above the average range value of the average of the latest ten subgroups 7 times consecutively.
E393	7below r cm		Trend deviation alarm, the subgroup CM range value has been below the average range value of the average of the latest ten subgroups 7 times consecutively.
E394	2sigma x cm		Trend deviation alarm, the last subgroup CM average is outside $\bar{XCM} \pm 2\sigma$ .
E395	2sigma r cm		Trend deviation alarm, the last subgroup CM range average is outside $\bar{RCM} \pm 2\sigma$ .
<b>E400-E499: Communication errors</b>			
E401	Duplicate device IDs on I/O bus	Yes	Two I/O devices with the same ID are present on the I/O bus.
E403	I/O device not responding	Yes	The I/O device is not properly connected or the ID of the device is not the same as the one configured.
E404	Selector is not connected or not responding	Yes	The selector is not properly connected or the ID of the selector is not the same as the one configured.

E405	IO Expander is not connected or not responding	Yes	The I/O expander is not properly connected or the ID of the I/O expander is not the same as the one configured.
E406	RE-alarm is not connected or not responding	Yes	The Remote alarm is not properly connected or the ID of the Remote alarm is not the same as the one configured.
E417	Too many communication sessions at one time		For example, ToolsTalk, ToolsNet, Operator panels
E420	ST accessory not supported		Unknkown device connected to the ST bus, not supported in this release.
E421	Safety trigger not supported by tool software		
E433	No RBU present	Yes	No RBU detected at start-up or RBU found missing at runtime.
E434	RBU Timeout	Yes	RBU did not respond to command from PF.
E436	RBU file system warning		There has been repairable fault in the RBU file system e.g. power-off or other interruption during download.
E437	RBU file system compt		The RBU file system has too many faults. Anattempt will be made to repair it by means of erasing the RBU.
E438	RBU file mismatch	Yes	A file with incorrect name or size was returned to a read request.
E440	<b>RBU no files</b>	Yes	
E441	<b>RBU no answer</b>	Yes	
E442	RBU no such file	Yes	
E444	RBU packet rejected	Yes	RBU responds with an answer not matching the last request. This is probably due to duplicates sent when the PF does not acknowledge packages.
E445	RBU corrupt	Yes	
E446	RBU read error	Yes	
E447	RBU write error	Yes	
E448	RBU delete error	Yes	
E449	RBU flush error	Yes	RBU Erase failed.
E450	RBU list error	Yes	
E451	RBU Update Failed	Yes	One of the database processes failed to synchronise the NVRAM with the RBU.

E460	FieldBus Type Mailbox Message Fault	-	
E461	FieldBus Type Gen Com Fault	-	
E462	FieldBus Mailbox Message Fault	-	
E463	FieldBus Gen Com Fault	-	
E464	FieldBus Hardware Fault	Yes	The FieldBus module is broken and has to be replaced.
E465	FieldBus Dip switch Error	-	The software tries to configure the value of node address or baudrate but the address switch on the FieldBus module is not in the right position to enable software setting. Set switches in the right position, then turn on the power.
E466	FieldBus Offline	-	The FieldBus went from Online to Offline. This is just a warning.
E467	FieldBus Configuration Fault	-	
E468	FieldBus Hardware Mismatch	-	The FieldBus module installed in PF 3000 is not the same FieldBus type as configured with TTPF. Change FieldBus module or configuration to get a match.
E469	FieldBus Init Error	-	RBU did not respond to command from PF.
E470	FieldBus PCP error	-	
E471	<b>Fieldbus claim area failed, lost one message</b>		One packet lost.
E472	<b>Fieldbus release area timeout</b>		Release area command timed out.
E473	Fieldbus communication buffer alarm		Communication buffer full. Decrease fieldbus update timer.
E474	Fieldbus monitor buffer alarm		Fieldbus monitor buffer full. Turn off fieldbus monitor mode.
E475	Fieldbus PsetID mismatch selector lifted socket		Fieldbus selected Pset does not file the lifted socket.
E480	Channel ID not valid	Yes	The channel ID configured is not within the limits permitted. The channel ID must be configured between 1 and 20.

<b>E500-E599: Hardware errors TOOL</b>			
E501	Tool overheated	-	The tool is too hot. The drive is disabled.
E502	Tool service interval expired	-	
E503	Calibration date expired		The calibration date has expired.
E504	Tool wear indicator alarm		Tool wear indicator alarm indicates that the tool should be serviced.
E505	Tool rebuilt to/from OE-type		Tool redesigned. E.g. angled tool type redesigned to an OE-tool-type
E510	Tool type not supported by RBU		The tool type is not supported by RBU.
E511	Tool-PF3000 size mismatch	Yes	Mismatch between the tool and the controller (for example S4/S7 tool connected to a S9 controller).
E513	Tool EEPROM corrupt – service tool	Yes	
E514	Tool EEPROM corrupt – Motortune	Yes	
E517	Tool maxtorque or Gear Ratio out of range	Yes	
E518	Tool normalisation out of range	-	
E519	Tool calibration value out of range		Tool calibration value out of range, service tool.
E520	Wear indicator data in tool invalid		Data in tool memory used for wear indicator is invalid. Service tool.
E531	Communication error		Communication error. Restart the controller. Only available for Tensor DS/DL.
E535	Torque transducer error	Yes	Cables to transducer cut off or shorted.
E536	No transducer (sensor)	Yes	Cables to transducer cut off or shorted.
E537	Calibration not OK, offset outside limits	Yes	Calibration limits out of bounds.
E538	Calibration not OK, CaVal outside limits	Yes	Calibration value outside limits.
E539	Calibration not OK, Offset changed > 5% of max value since last calibration	-	Calibration not OK, Offset changed > 5% of max value since last calibration.

E540	Calibration not OK, CalVal changed > 5% of max value since last calibration	-	Calibration not OK, calibration value changed > 5% of max value since last calibration.
E541	Other calibration error	Yes	
E550	Radio contact with tool established, tool accessible		Radio contact with tool established, tool accessible.
E551	Radio contact with tool lost, tool inaccessible		Radio contact with tool, lost inaccessible
E552	DASP Communication error with tool		Communication error between tool and controller on DASP level. Not possible to read or write from/to an ALP reference.
E553	Pairing attempt with wireless tool failed		An attempt to pair the Power Focus with a wireless tool failed.
E554	Command not performed, wireless tool inaccessible		A command (batch increment, reset batch etc.) could not be performed and was discarded because the tool was currently inaccessible.
E555	Condition change not reflected in tool, wireless tool inaccessible		A condition change in the controller (Pset selection, Job selection, Job aborted etc.) could not be reflected in the tool. The tool was currently inaccessible.
E556	Tool battery low	Tool battery low.	
<b>E600-E699: Hardware errors DC3000/MC3000</b>			
E601	Dcbus LO at start of rundown	Yes	DC voltage too low
E603	Drive overheated		The DC drive is too hot, drive deactivated.
E618	Drive HW/SW mismatch		Drive hardware and software mismatch. Check motor type in Tools Talk DS/DL.
E619	Drive deactivated		DC drive deactivated during operation.
E620	Tool stall		Tool motor stall.
E621	High current offset		High current offset at tightening start.
E625	Dcbus Lo, primary		Restart controller. If problem still remains check line voltage.

E626	Dcbus Lo, 40V		Restart controller. If problem still remains contact the local Atlas Copco service representative.
E631	Contact card error		Contact card error. Contact the local Atlas Copco service representative.
<b>E700-E799: Hardware errors</b>			
E700	PF started	-	This error code is only visible in the error log and used when the Power Focus is started.
E701	Backup battery low level		The backup battery level is low. The battery should be changed soon. Contact the local Atlas Copco service representative.
E702	Backup battery empty or missing		The backup battery level is very low or the battery is missing. A new battery should be inserted as soon as possible. Contact the local Atlas Copco service representative.
E710	ACTA/QRTT calibration		An ACTA/QRTT calibration has been performed.
E720	Earth failure in ST tool		An earth (ground) fail detected, probably a cable failure.
E721	Internal ST tool failure		Internal ST tool failure
E722	Illegal ring position	-	The reverse ring is not in a defined position.
<b>E800-E899: Software errors</b>			
E805	(PF Model unknown)	Yes	This error is displayed after start-up when the RBU is missing, or when the RBU revision cannot be supported by the controller (e.g bronze RBU on a graph unit), or when the RBU license file is missing or cannot be read by the boot code.
E808	Error condition detected by software		An error condition was detected by software.
E810	Database is corrupt		Database must be cleared, the database version is not correct.
E822	No Job ACC from control	Yes	Tightening initialisation phase failed. Hardware failure.
E823	No calibration result	Yes	No calibration was received from the drive during the tightening initialisation phase (timeout 100 ms).

E824	Cycle abort timeout	-	No tightening result was received from the drive before the Cycle abort timeout. The Cycle Abort timer is configurable in the Pset.
E831	Autoset wrong angle	-	Autoset could not be executed, the angle results of the tightening performed were null.
E833	Autoset tight NOK result	-	The Autoset could not be executed, four NOK tightenings were performed.
E834	Autoset rejected Pset in CCW direction	-	The Autoset was not allowed by the PF3000 for this Pset because the Pset was configured in the CCW direction. Auto set is only permitted on CW Pset.
E840	Feature Not Available In Software Revision		This error is displayed if an attempt is made to run multistage with a bronze version, or handle a Pset with a Pset ID larger than the max number of Pset (larger than 64 in a bronze version or larger than 250 in a silver or gold version).
E841	SW function Not Available for this tool type		The software function is not available for this tool type.
E851	Connection with Tools Net server lost	-	The connection with the ToolsNet server was lost, the PF3000 is trying to reconnect. The Tools Net server might be down or it might be an Ethernet cable problem.
E856	Router unreachable		The router programmed in the configuration setting could not be reached. Check the network configuration and in particular the sub net mask and the default router.
E857	Reboot needed before changes take effect		The configuration changes will not take effect before a system reboot.
E858	IP address already in use	Yes	The IP address of this PF3000 is already in use by another system.
E859	IP address collision	-	Another system attempts to use the same IP address as this PF3000.
E862	Ethernet overload Error		The Ethernet driver of the PF3000 is switched off due to an overloaded network.

E863	IP Port already in use	Yes	An attempt was made to bind a TCP or UDP socket to a port already in use. For instance, a customer protocol might be using the same port as ToolsTalk.
E864	Ethernet echo detected	-	An Ethernet packet was discarded, since its source MAC address was equal to the PF's own MAC address. Notice that this message only occurs once during runtime, even if several such packets are detected. There is most likely a problem in the network.
E870	Syncmember registration failure	-	The sync member registration failed. Two sync members can have the same channel ID or one PF3000 with a sync reference IP address is missing in the sync list.
E871	Syncmaster configuration failure	-	The master channel iD is not first in the sync list.
E872	Sync initialisation failure	-	The tightening synchronisation initialisation failed. Check the CAN bus cable, check that all the sync members have the same active Pset, check the external start bridge
E873	Synchrotork not yet implemented	-	Synchro tork not yet implemented, check the sync configuration.
E874	Sync members missing		Only sync reference is defined in the sync list.
<b>E900-E999: Errors MMI3000</b>			
E901	MMI Start-up Error	Yes	Error in MMI detected.
<b>END</b>			

**This quick guide is based on the Power Focus W7.2 manual**







[www.atlascopco.com](http://www.atlascopco.com)



9833 1829 01    Ätta 45 Tryckeri AB 2008:1